

Appln. No.: 10/707,993
Docket No.: 144213/GEM-0099

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AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (original) A method for acquiring cardiac information from a patient having a pacemaker for pacing a heart rhythm, an abnormal EKG, or an abnormal heartbeat, the method comprising:

placing a signal injection device proximate the pacemaker of the patient and injecting a signal across a skin barrier of the patient toward the pacemaker;

in response to the signal received at the pacemaker, pacing the patient's heart in a fixed asynchronous pacing mode; and

acquiring cardiac information relating to the patient's fixed asynchronously paced heart.

2. (original) The method of Claim 1, further comprising:

acquiring a cardiac image of the patient's fixed asynchronously paced heart.

3. (original) The method of Claim 1, wherein:

the signal is a magnetic signal, a wireless signal, an x-ray signal, a microwave signal, an infrared signal, or any combination of signals comprising at least one of the foregoing; and
the signal is at least one of a fixed signal and a pulsed signal.

4. (original) The method of Claim 1, wherein the signal injection device is a magnetic signal injection device comprising at least one of a fixed magnet and an electromagnet.

5. (original) The method of Claim 1, further comprising:

in response to the signal received at the pacemaker, activating a switch at the pacemaker for pacing the patient in a fixed asynchronous pacing mode.

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6. (original) The method of Claim 4, wherein the magnetic signal injection device is adapted to produce a magnetic signal having a signal strength at the pacer equal to or greater than about 90 Gauss.

7. (original) The method of Claim 6, wherein the magnetic signal injection device produces a magnetic signal having a signal strength at the pacer equal to or greater than about 90 Gauss when placed at a distance equal to or less than about 2 inches from the pacer.

8. (original) The method of Claim 4, wherein the magnetic signal injection device has an outside dimension equal to or greater than an outside dimension of the pacer.

9. (original) The method of Claim 1, wherein the fixed asynchronous pacing mode includes a ventricular, an atrial, or a dual chamber asynchronous pacing mode.

10. (original) A method for acquiring a cardiac image from a patient having a pacer for pacing a heart rhythm, an abnormal EKG, or an abnormal heartbeat, the method comprising:

- receiving a gated electrocardiogram signal having local maxima and minima values and trigger points;

- determining for a period of time the time between each trigger point and the local maxima or minima associated therewith;

- in response to the trigger point occurring at the associated local maxima or minima, calculating a zero time differential for a corrected trigger for gating;

- in response to the trigger point occurring prior to the associated local maxima or minima, calculating a time delay for the corrected trigger;

- in response to the trigger point occurring after the associated local maxima or minima, calculating a time advancement for the corrected trigger;

- sending the corrected trigger to a cardiac image acquisition device for gating, wherein the gating is substantially synchronized with the local maxima or minima of the gated electrocardiogram signal;

- placing a signal injection device proximate the pacer of the patient and injecting a signal across a skin barrier of the patient toward the pacer;

- in response to the signal received at the pacer, pacing the patient's heart in a fixed

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asynchronous pacing mode; and

acquiring a cardiac image of the patient's fixed asynchronously paced heart.

11. (original) The method of Claim 10, wherein the signal injection device is a magnetic signal injection device comprising at least one of a fixed magnet and an electromagnet.

12. (original) The method of Claim 11, further comprising:
in response to the magnetic signal received at the pacer, activating a switch at the pacer for pacing the patient in a fixed asynchronous pacing mode.

13. (original) The method of Claim 11, wherein the magnetic signal injection device is adapted to produce a magnetic signal having a signal strength at the pacer equal to or greater than about 90 Gauss when placed at a distance equal to or less than about 2 inches from the pacer.

14. (original) The method of Claim 11, wherein the magnetic signal injection device has an outside dimension equal to or greater than an outside dimension of the pacer.

15. (original) The method of Claim 10, wherein the fixed asynchronous pacing mode includes a ventricular, an atrial, or a dual chamber asynchronous pacing mode.

16. (original) An apparatus having electrocardiogram-gated acquisition and cardiac imaging capabilities for use with a patient having a pacer, the apparatus comprising:

an electrocardiograph;

a cardiac scanner in signal communication with the electrocardiograph;

an interface board in signal communication intermediate the electrocardiograph and the cardiac scanner; and

a storage medium, readable by a processing circuit, storing instructions for execution by the processing circuit for:

receiving from the electrocardiograph a gated electrocardiogram signal having local maxima and minima values and trigger points;

determining for a period of time the time between each trigger point and the local

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maxima or minima associated therewith;

in response to the trigger point occurring at the associated local maxima or minima, calculating a zero time differential for a corrected trigger for gating; and

in response to the trigger point occurring prior to the associated local maxima or minima, calculating a time delay for the corrected trigger;

in response to the trigger point occurring after the associated local maxima or minima, calculating a time advancement for the corrected trigger;

sending the corrected trigger to a cardiac image acquisition device for gating, wherein the gating is substantially synchronized with the local maxima or minima of the electrocardiogram signal;

wherein the patient is responsive to a signal injection device placed proximate the pacemaker of the patient, the signal injection device being adapted to inject a signal across a skin barrier of the patient toward the pacemaker;

wherein in response to the signal being received at the pacemaker, the patient's heart is paced in a fixed asynchronous pacing mode; and

acquiring a cardiac image at the cardiac image acquisition device of the patient's fixed asynchronously paced heart.

17. (original) The method of Claim 16, wherein the signal injection device is a magnetic signal injection device comprising at least one of a fixed magnet and an electromagnet.

18. (original) The method of Claim 17, wherein the magnetic signal injection device is adapted to produce a magnetic signal having a signal strength at the pacemaker equal to or greater than about 90 Gauss when placed at a distance equal to or less than about 2 inches from the pacemaker.

19. (original) The method of Claim 16, wherein the fixed asynchronous pacing mode includes a ventricular, an atrial, or a dual chamber asynchronous pacing mode.

20. (new) A method for acquiring cardiac information from a patient having a pacemaker for pacing a heart rhythm, an abnormal EKG, or an abnormal heartbeat, the method performed using an apparatus having electrocardiogram-gated acquisition and cardiac

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imaging capabilities for use with a patient having a pacemaker, the apparatus comprising an electrocardiograph, a cardiac scanner in signal communication with the electrocardiograph, an interface board in signal communication intermediate the electrocardiograph and the cardiac scanner, and a storage medium, readable by a processing circuit, storing instructions for execution by the processing circuit for performing aspects of the method, the method comprising:

placing a signal injection device proximate the pacemaker of the patient and injecting a signal across a skin barrier of the patient toward the pacemaker;

in response to the signal received at the pacemaker, pacing the patient's heart in a fixed asynchronous pacing mode; and

acquiring cardiac information relating to the patient's fixed asynchronously paced heart.